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straight line whose equation is, supposing $u > v$,

$$y = \frac{b - x}{\sin\beta}\left(n - \cos\beta\right).$$

When $v = 0$ (and $\therefore n = 0$), equations (1) and (2) represent the ordinary curve of pursuit.

If we make $m = \frac{1}{2}$ and $n = 1$ ($\therefore u = v = \frac{2}{3}w$), the path becomes a parabola whose focal distance is equal to $c = b \tan\frac{1}{2}\beta$.

As a final example, suppose $w = 0$; therefore $m = -n$. That is, the boat is directed toward a *fixed object.* Equation (1) reduces to

$$y = \frac{c^m x^{1-m}}{2} - \frac{x^{1+m}}{2c^m} - a\cos\beta;$$

and the expression for c becomes

$$c^m = b^m \cot\tfrac{1}{2}\beta.$$

If in the last equation we make $m = 1$, we shall have

$$y = \frac{a(1 - \cos\beta)}{2} - \frac{x^2}{2c};$$

the equation of a parabola whose axis is AP'', and whose focal dist. is $\frac{1}{2}c$.

If $t =$ the time from the starting point, we shall have,

$$ut = \frac{a(1 - m\cos\beta)}{1 - m^2} - \frac{c^m x^{1-m}}{2(1-m)} - \frac{x^{1+m}}{2c^m(1+m)}.$$

This equation is true for all finite values of m, positive or negative. When $x = 0$, and $m < 1$, we have the whole time of crossing

$$T = \frac{a(1 - m\cos\beta)}{u(1 - m^2)}.$$

If $\cos\beta = m$, we have $T = a \div u$. That is, if the boat, at starting, be directed toward an object at A, so that the angle $PAO = \cos^{-1}m$; then, as the object, A, moves from A to P'', the boat will describe the curve $PP'P''$ in the same time that would be required to move from P to A along the line PA with the same velocity, if there were no current.

MR. GLAISHER'S ENUMERATION OF PRIMES.

COMMUNICATED BY PROF. JOHNSON.

In the Report for 1879, of the committee on mathematical Tables to the British Association, Mr. J. W. L. Glaisher extends his enumeration of primes over the fourth million, by means of Mr. James Glaisher's factor table for this million, which has just been printed. The results of the enumeration of primes are given in the same form as those referred to at p. 7, Vol.

V, ANALYST; viz., the number of "centuries" which contain no primes, 1 prime, 2 primes, &c., is given for each group of 10,000 in the million, and also the total number of primes in each group. These totals for the first three, and for the 7th, 8th and 9th millions were quoted at pages 7 and 8, Vol. V: for the fourth million they are as follows:—

1st	group	6676	+41
2nd	"	6717	—26
3rd	"	6691	—52
4th	"	6639	—28
5th	"	6611	—36
6th	"	6575	+96
7th	"	6671	—81
8th	"	6590	+36
9th	"	6624	—89
10th	"	6535	

Total in 4th million 66,329.

In a paper published in the Proceedings of the Cambridge Philosophical Society, Mr. Glaisher has discussed his results in connection with Legendre's formula for the number of primes inferior to x, viz.,

$$\frac{x}{\log x - A},$$

in which Legendre's value of A was 1.08366, which it is supposed was empirically determined chiefly from the value $x = 10{,}000$.

In order that the formula should agree with the logarithmic integral

$$\int_0^x \frac{du}{\log u},$$

Mr Glaisher has shown that we should have, as a first approximation,

$$A = 1 + (1 \div \log x),$$

[agreeing with what was shown by Tchebycheff, that when x is infinite we must have $A = 1$] accordingly he has compared the actual number of primes counted with the value of

$$\frac{x}{\log x - 1 - (1 \div \log x)}, \qquad (1)$$

as well as with Legendre's formula and $x \div (\log x - 1.08365)$ (2), and with $x \div (\log x - 1)$ (3). The comparison is made for values of x at intervals of 250,000 and the final results are that, for $x = 4{,}000{,}000$, while Legendre's formula (2) gives 177.3 in excess, (3) gives 1,491.7 in defect and (1) gives 181 in defect. It may be remarked that the omitted terms in the value of A are all positive so that the second approximation to A which is

$$A = 1 + \frac{1}{\log x} + \frac{3}{(\log x)^2},$$

would give a result still nearer the actual number of primes counted.